Alg. 2 Warm Up # 7-4

1. Combine and simplify:

$$\frac{3x}{2x^2 - 8x} + \frac{2}{x - 4}$$

2. Solve by completing the square.

$$x^2 + 8x - 8 = 0$$

3. Write in graphing form by completing the square.

$$y = 3x^2 + 18x - 1$$

HW Questions:

Preview

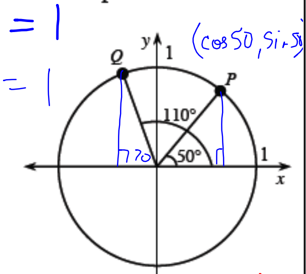
7-53. Use the Pythagorean Identity to find the exact coordinates of a point on the unit circle that has $\sin\theta = \frac{1}{4}$.

$\sin^2\theta + \cos^2\theta = 1$

$\left(\frac{1}{4}\right)^2 + \cos^2\theta = 1$

point: $\left(\frac{\sqrt{15}}{4}, \frac{1}{4}\right)$

7-54. Find the coordinates of points P and Q on the unit circle at right.



$\frac{1}{16} + \cos^2\theta = \frac{16}{16}$

$-\frac{1}{16} \qquad -\frac{1}{16}$

$\sqrt{\cos^2\theta} = \sqrt{\frac{15}{16}}$

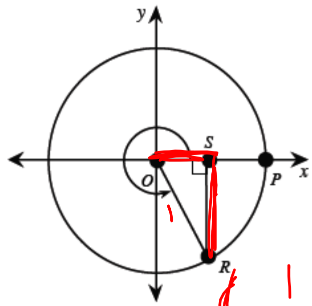
$\cos\theta = \frac{\sqrt{15}}{4}$

$(\cos\theta, \sin\theta)$

$(\cos 110°, \sin 110°)$

$Q \approx (-0.34, 0.94)$

7-55. The measure of $\angle ROS$ in ΔROS below is 60°.

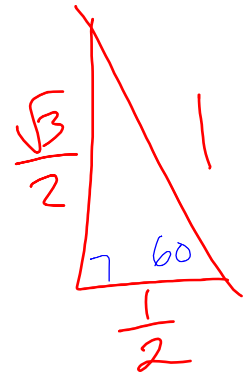


a. The curved arrow represents the rotation of $\overline{OR}$, beginning from the positive x-axis. Through how many degrees has $\overline{OR}$ rotated?

b. If $OR = 1$, what are the *exact* lengths of OS and SR?

c. What are the *exact* coordinates of point R?

$\left(\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$

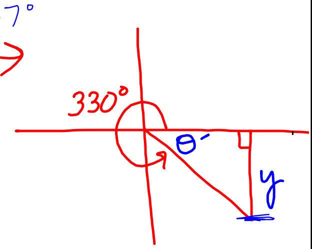


7-56. What angle in the first quadrant could you reference to help you find the sine and cosine of each of the following angles?

a. 330° b. 120° c. 113° d. 203°

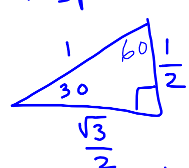
$$\begin{array}{r} 180 \\ -\ 113° \\ \hline 67° \end{array}$$

7-57. Solve $\left(\frac{1}{8}\right)^{(2x-3)} = \left(\frac{1}{2}\right)^{(x+2)}$ for x.



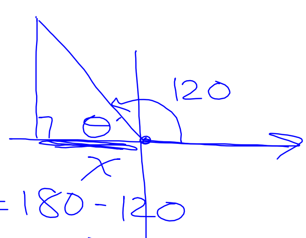
$\theta' = 30°$

from special △



$\sin 30° = \frac{1}{2}$

So $\sin 330° = -\frac{1}{2}$



$\theta' = 180 - 120$

$\theta' = 60°$

$\sin 60° = \sin 120° = \frac{\sqrt{3}}{2}$

$\cos 120° = -\frac{1}{2}$

7-58. Sketch a graph of each equation below.

a. $y = -2(x-2)^2 + 3$

b. $y = (x-1)^3 + 3$

7-59. Solve $3^x + 5 = x^2 - 5$ using any method.

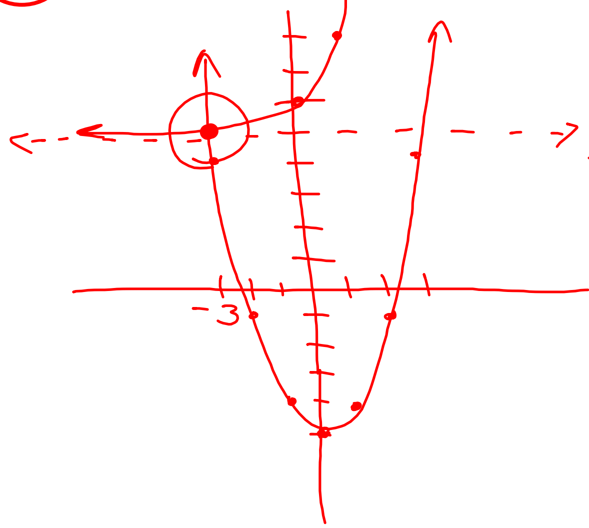
$y = 3^x + 5$

check

$x = -3.1$

$= -3.2$

$= -3.3$



7-60. Rip-Off Rentals charges $25 per day plus 50¢ per mile to rent a mid-sized car. Your teacher will rent you his or her family sedan and charge you only 3¢ if you drive one mile, 6¢ if you drive two miles, 12¢ if you drive three, 24¢ for four, and so on. let x = # of miles, y = cost, z = # of days

a. Write an equation that will give you the cost to rent each car.

b. If you plan to rent the car for a two-day road trip, which is the better deal if you drive 10 miles? 20 miles? 100 miles?

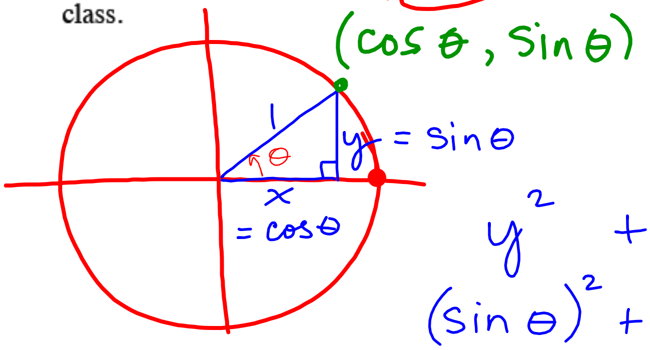
7-61. Refer back to your solutions from problems 7-23, 7-32, and 7-44. Explain how these problems are related.

a) $y = 25z + 0.5x$

$y = (0.03)2^{(x-1)}$

Yesterday's CP's:

7-48. If you know the sine of an angle in a unit circle, can you find its cosine? How? Work with your team to find a strategy and be prepared to share it with the class.



$$y^2 + x^2 = 1^2$$

$$(\sin\theta)^2 + (\cos\theta)^2 = 1^2$$

$$\boxed{\sin^2\theta + \cos^2\theta = 1}$$

CP's: 7- #50 ---> 52 (Pink) p. 328

7-50. Obtain a copy of the Lesson 7.1.4A Resource Page from your teacher. You will use the same process to graph the cosine function as you did to graph the sine function, but you need to use the base of the triangle instead of the height.

a. Label the length of the base of each triangle in the unit circle. Plot these lengths at their angle location on the coordinate system to the right of the circle. You will be plotting points in the form (x = angle in degrees, y = base).

b. Draw five new triangles that are congruent to the first five, but that are located in the second quadrant. Label the angle measure (from 0°) and the base for each triangle. Add five new corresponding points to the graph.

c. Continue this process by drawing triangles in the third and fourth quadrants. You should have a total of twenty triangles drawn and twenty points plotted. Then find the four points where the circle crosses the axes and label them with both their angle measures and their horizontal distances from the origin. Add points for these to the graph on the right as well. Finally, sketch a smooth curve through the points.

d. Compare this graph to the sine graph you got from graphing heights in problem 7-14. How are the two graphs similar? How are they different?

7-51. Remember the scary Ferris wheel, *The Screamer*? LaRasha does! She was riding *The Screamer*, sitting 27 horizontal feet away from the central support pole, when the ride stopped. What was her seat's angle of rotation? Is there more than one possibility? Justify your answer using as many representations as you can.

7-52. UNIT CIRCLE ↔ GRAPH

In problem 7-51, did you use a graph of $y = \cos\theta$ to find lengths of bases of triangles?

a. Use the Lesson 7.1.4B Resource Page (a cosine-calculator graph) provided by your teacher to find the length of the base of a triangle formed by a seat on *The Screamer* that had rotated $130°$ from the starting platform.

b. Are there any other triangles with the same base? If so, mark their corresponding points on your cosine calculator.

c. How can you use the symmetry of the cosine-calculator graph to calculate the angle location of seats on *The Screamer* that have the same base? Is your method different than the one you used to find the heights?

Get organized and staple up:

Week 7 Classwork

Warm Up

7 - # 14 (green)

7- # 33, 34

7- # 45 ---> 49

7- # 50 ---> 52 (pink)

HW: 7-

62 ---> 70

Short Quiz Friday:

Combine rational expressions

Completing the Square